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Evaluation of New Canal Point Sugarcane Clones

1998–99 Harvest Season

ABSTRACT

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Twenty-eight replicated experiments were conducted on nine farms (representing five organic soils and two sand soils) to evaluate 44 new Canal Point (CP) clones of sugarcane from the CP 94, CP 93, CP 92, and CP 91 series. Experiments compared the cane and sugar yields of the new clones, complex hybrids of *Saccharum* spp., with yields of CP 70–1133, a minor commercial cultivar on organic soils and the third most widely grown cultivar on sand soils in Florida. Each clone was rated for its susceptibility to diseases, and all but the CP 91 series clones were rated for their susceptibility to cold temperatures.

The audience for this publication includes geneticists, researchers, growers, extension agents, and individuals in industry who are interested in sugarcane clone development.

Keywords: Histosol, muck soil, organic soil, *Puccinia melanocephala, Saccharum* spp., stability-safety index, sugarcane cultivars, sugarcane rust, sugarcane smut, sugarcane yields, sugar yields, *Ustilago scitaminea*.

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EVALUATION OF NEW CANAL POINT SUGARCANE CLONES
1998-99 Harvest Season

B. Glaz, P.Y.P. Tai, J.C. Comstock, J.D. Miller, J. Follis, and L.Z. Liang

Clonal selection at precommercial stages supports the commercial production of sugarcane, complex hybrids of *Saccharum* spp. Although production of sugar per unit area is a very important characteristic, it is not the only factor on which sugarcane is evaluated. In addition, the concentration of sugar and the fiber content of the cane are analyzed. Several of the clones with high yields of sugar per hectare identified in this report will never become commercial cultivars.

Deren et al. (1995) explain mathematically how sugar yield is not the only economic factor on which sugarcane yields are judged. The time of year and the duration that a clone yields its highest amount of sugar per unit area can be very important, since sugarcane harvest seasons extend from fall to spring. Because sugarcane is commercially grown in plant and ratoon crops, clones are evaluated accordingly. Adaptability to mechanical harvesting and mechanical seed cane cutting are important traits in Florida.

Information about the stability of a clone's performance across environments aids in selecting clones that will yield well across all environments. Stability measurements also enable identification of clones that will perform well only in some environments. This stability factor is important in our evaluations because of the wide range of environments for growing sugarcane in Florida. As differences widen for such characteristics as temperature, moisture, and soil, region-specific clones become necessary because few clones produce high yields in markedly different environments.

Clones with desired agronomic characteristics also must be productive in the presence of harmful diseases, insects, and weeds. Some pests rapidly develop new, virulent races or strains. Clonal resistance to such pathogens often changes over time, so no clone can be considered permanently resistant. The selection team must try not to discard clones that have sufficient resistance or tolerance to pests, and it must discard clones that are too susceptible to pests to be grown commercially. Sugarcane growers in Florida rely much more on tolerance than resistance to sugarcane diseases. In the 1998 growing season, not counting about 20 percent of the area for which cultivars were not specified, the top seven cultivars made up 91.9 percent of the total Florida sugarcane area (Glaz 1998). Each of these seven cultivars—CP 80–1827, CP 72–2086, CP 80–1743, CL 61–620, CP 73–1547, CP 78–1628, and CP 70–1133—was susceptible to at least one of the following sugarcane diseases: rust, mosaic, leaf scald, or smut. Glaz et al. (1986) presented a formula and procedure to help growers distribute their available sugarcane cultivars while considering possible attacks of new pests.

The disease that has caused the most difficulty in Florida in selecting resistant sugarcane cultivars is sugarcane rust, caused by *Puccinia melanocephala* Syd and P. Syd. The disease against which Florida sugarcane growers and scientists have had the most success in selecting resistant cultivars is sugarcane smut, caused by *Ustilago scitaminea* Syd and P. Syd. Other diseases with which Florida sugarcane growers must contend are leaf scald, caused by *Xanthomonas albilineans* (Ashby) Dow; yellow leaf syndrome, caused by a luteovirus (Lockhart et al. 1996); and sugarcane mosaic virus. Ratoon stunt disease (RSD)—caused by *Clavibacter xyli* subsp. *xyli* Davis, Gillaspie, Vidaver, and Harris—has probably been the most damaging, although the least visible, sugarcane disease in Florida. Some grow-

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ers minimize losses from RSD by using hot-water treatments to obtain disease-free seed cane. Scientists at Canal Point screen clones for resistance to rust, smut, leaf scald, mosaic, RSD, and eye spot. Eye spot, caused by *Bipolaris sacchari* (E.J. Butler) Shoemaker, is not currently a commercial problem in Florida.

Damaging insects in Florida of long duration are the sugarcane borer, *Diatraea saccharalis* (F.); the sugarcane wireworm, *Melanotus communis*; and the sugarcane grub, *Ligyrus subtropicus*. An insect discovered in Florida in 1990, the sugarcane lace bug, *Leptodictya tabida* (Hall 1991), has also become a pest, selectively feeding on some clones. In 1994, another insect pest new to commercial sugarcane fields in Florida was found—the West Indian cane weevil, *Metamasius hemipterus* (L.) (Sosa 1995). In 1994, this weevil caused particularly severe damage to several plantings of CP 85–1382, a promising new clone described previously in this series of reports.

Geneticists at Canal Point are working to incorporate borer resistance into the breeding program by selecting for leaf pubescence (a trait known to promote resistance) in elite sugarcane clones (Sosa 1996). Currently, there are no known commercial sugarcane cultivars with pubescent leaves.

Winter freezes are common in the region of Florida where much of the sugarcane is produced. The severity and duration of a freeze and the specific sugarcane cultivar are the major factors that determine how much damage occurs. The damage caused by such freezes ranges from none to death of the mature sugarcane plant. The sugar content of these plants declines rapidly if temperatures return to normal, warmer ranges soon after the freeze. Stalk populations may decline after severe freezes kill recently planted and emerged sugarcane plants. Beginning last year, this report has included reactions of sugar content of mature sugarcane after a freeze. Updated information is included in table 1.

A new emphasis for the Canal Point genetics program is to breed and select sugarcane cultivars that will enhance sugarcane's relationship with the surrounding Everglades. Two strategies being pursued are to breed and select clones that help to reduce the phosphorus content of water discharged from Florida sugarcane farms (Glaz et al. 1997) and that will yield well in soils with higher water tables.

Each year at Canal Point, approximately 100,000 seedlings are evaluated from crosses derived from a diverse germplasm collection. [However, reports from Mangelsdorf (1983) and Deren (1995) contend that the genetic base of U.S. sugarcane breeding programs is too narrow.] This year, most of the parental clones in the Canal Point program originated from Canal Point. In addition, clones used as parents this season came from Clewiston (Florida), Louisiana, Texas, and Réunion, in the Indian Ocean. Also, several feral *Saccharum officinarum* and *S. robustum* clones and interspecific hybrids of these clones were used as parents.

About 10 percent of 100,000 seedlings from the seedling stage are advanced to stage I, whence about 10 percent of the 10,000 clones are advanced to stage II. The 1,000 clones in stage II were visually selected in the seedling and stage I phases. Once selected as seedlings, clones are vegetatively or clonally propagated. From this stage on in the selection program, all reproduction is vegetative; hence each plant (clone) is genetically identical to its precursor, assuming no mutations or the unlikely formation and germination of true seeds in our plots. From these 1,000 selected clones in stage II, about 130 are selected for continued testing in replicated experiments. The seedling stage, stage I, and stage II are each evaluated for 1 year in the plant-cane crop at the USDA Sugarcane Field Station in Canal Point. The primary selection criteria for the stage II and all subsequent stages are sugar yields, cane tonnage, and disease resistance.

The stage III clones are evaluated for 2 years in the plant-cane and first-ratoon crops at four locations, all in commercial sugarcane fields. The

11 most promising clones receive continued testing for 4 more years in the stage IV experiments reported in this annual publication. Tai and Miller (1989) also described this selection program from the seedling phase to stage IV. Clones that successfully complete these experimental phases undergo 2 to 4 years of evaluation and seed-cane increase by the Florida Sugar Cane League, Inc., before commercial release. Some of this evaluation occurs concurrently with the evaluations described here.

Clones with characteristics that may be valuable for sugarcane breeding programs are identified throughout the selection process. Sugarcane geneticists in other programs often request clones from Canal Point. From May 1998 to April 1999, CP clones or seeds were requested from and sent to Ecuador, Egypt, El Salvador, Morocco, Pakistan, Peru, and Switzerland. California, Georgia, Kansas, New York, and Texas, and five other locations in Florida, also received Canal Point clones.

The purpose of this report is to summarize the performance of the clones in the plant-cane, first-ratoon, and second-ratoon stage IV experiments in Florida's 1998–99 sugarcane harvest season.

TEST PROCEDURES

In 28 experiments, 44 new CP clones (11 clones of the CP 94 series in the plant-cane crop, 11 clones of the CP 93 series in the plant-cane and first-ratoon crops, 11 clones of the CP 92 series in the first- and second-ratoon crops, and 11 clones of the CP 91 series in the second-ratoon crop) were evaluated at nine farms.

CP 70–1133 was the reference clone in all 28 experiments. It was the third most widely grown cultivar on sand soils but only a minor cultivar on organic soils in Florida. Overall, CP 70–1133 was the eighth most widely grown sugarcane cultivar in Florida (Glaz 1998).

The CP 93 series first-ratoon experiment and the second-ratoon experiment at Okeelanta Corporation (Okeelanta) south of South Bay and the first-ratoon experiment at Knight Management, Inc. (Knight), southwest of 20-Mile Bend were conducted on Dania muck. As described by McCollum et al. (1976), Dania muck is the shallowest of the organic soils in the Everglades Agricultural Area that is composed primarily of decomposed sawgrass (*Cladium jamaicense* Crantz). The maximum depth to bedrock in a Dania muck is 51 cm. The other organic soils similar to Dania muck are Lauderhill (51–91 cm deep to bedrock), Pahokee (91–130 cm deep), and Terra Ceia mucks (more than 130 cm deep).

Six experiments were conducted on Lauderhill muck—the second-ratoon experiments at A. Duda and Sons, Inc. (Duda), southeast of Belle Glade and Sugar Farms Co-Op Western Division (SFCW) east of Canal Point; both plant-cane and the first-ratoon CP 93 series experiments at Okeelanta; and the plant-cane experiment at Wedgworth Farms, Inc. (Wedgworth), east of Belle Glade.

Nine experiments were conducted on Pahokee muck—all three experiments at Sugar Farms Co-Op Eastern Division (SFCE) near 20-Mile Bend in Palm Beach County, the plant-cane and first-ratoon experiments at Duda, the plant-cane and second-ratoon experiments at Knight, and the two ratoon experiments at Wedgworth.

The plant-cane experiment at SFCW was planted on a Terra Ceia muck. The three experiments at Eastgate Farms, Inc. (Eastgate), north of Belle Glade were on Torry muck. The three experiments at Hilliard Brothers of Florida Ltd. (Hilliard) west of Clewiston were on Malabar sand. The three experiments at Lykes Brothers' Farm (Lykes) near Moore Haven in Glades County were on Pompano fine sand.

The CP 93 and CP 92 series experiments at Lykes and the CP 93 series plant-cane and the CP 92 series first-ratoon experiments at Okeelanta were planted on fields in successive sugarcane rotations. The other experiments were planted in fields that had not been cropped to sugarcane for approximately 1 year. In all experiments, clones

were planted with two lines of seed cane per furrow in plots arranged in randomized complete-block designs with eight replications. Each three-row plot was 10.7 m long and 3 m wide (0.0032 ha). The distance between rows was 1.5 m, and 1.5-m alleys separated the front and back ends of the plots. The outside row of each plot was a border row, and it was usually planted with the same clone as the inside two rows. An extra 1.5 m of sugarcane protected the front and back of each test.

Samples of 10 stalks per plot were cut from unburned cane from all plots in each experiment between October 2, 1998, and March 11, 1999. In all experiments, one sample per plot was cut from the middle row of each plot. In addition, a preharvest sample was cut from two replications of 12 plant-cane experiments between October 15, 1998, and October 28, 1998. For all samples, once a stool of sugarcane was chosen for cutting, the next 10 stalks in the row were cut as the 10-stalk sample. The range of sample dates for each crop was as follows:

Plant-cane crop	November 26, 1998, to March 10, 1999
First-ratoon crop	November 27, 1998, to March 11, 1999
Second-ratoon crop	October 2, 1998, to December 29, 1998

After the stalk samples were transported to the Agricultural Research Service's Sugarcane Field Station at Canal Point for weighing and milling, crusher juice samples from the stalks were analyzed for Brix and pol[2], and theoretical recoverable yields of 96° sugar in kilograms per metric ton of cane (KS/T) were determined as a measure of sugar production. The procedure used to calculate these yields using fiber percentages is described by Legendre (1992).

Total millable stalks per plot were counted between July 5 and October 9, 1998. Yields of metric tons of cane per hectare (TC/H) were calculated by multiplying stalk weights by number of stalks. Theoretical yields of metric tons of sugar per hectare (TS/H) were calculated by multiplying TC/H by KS/T and dividing by 1,000.

Analyses of variance were done using procedures described by McIntosh (1983). *F*-ratios were chosen according to a mixed model, with clones fixed and locations random. The source of variation that corresponded to the error term for the effect being tested was used to calculate the least significant difference (*LSD*). Least significant difference was used regardless of significance of *F*-ratios in all analyses to protect against high type-II error rates, and significant differences were sought at the 10-percent probability level (Glaz and Dean 1988).

Analyses of clonal stability across locations were done by using procedures recommended by Shukla (1972). For each clone, the stability-variance parameter of Shukla was subsequently used to calculate (at the 1-percent probability level) the stability-safety index described by Eskridge (1990). The mean yield of the clone and the stability of the clone across locations influence the value of this stability-safety index. The higher the stability-safety index, the more likely the clone is to have high yields at all locations.

Before the clones were evaluated in stage IV, they were tested in separate tests by artificial inoculation for susceptibility to sugarcane smut, sugarcane mosaic virus, leaf scald, and RSD. Clones were inoculated in stage II plots to determine eye spot susceptibility. Since being advanced to stage IV, separate artificial-inoculation tests were repeated for smut, RSD, mosaic, and leaf scald. Each clone was also rated for its reactions to natural infection by sugarcane smut, sugarcane rust, sugarcane mosaic virus, and leaf scald. The

[2] *Brix* represents the apparent solids in a sugar solution and is measured as a percentage; it was measured with a refractometer that automatically corrects for temperature. *Pol* measures the polarization by degrees of the sugar solution in a polarimeter.

farm management at each location controlled sugarcane management practices such as fertilization, cultivation, and pest control.

Two separate tests were conducted at Gainesville, Florida, to determine cold tolerance of clones from the CP 92, CP 93, and CP 94 series. These tests were conducted at the Florida Institute of Food and Agricultural Sciences Greenacre Agronomy Farm. The experiments were planted in randomized complete blocks with six replications. Plots were 1.5 m long and 2.1 m wide. A moderate freeze of –2.2 °C occurred on December 6, 1998, and another moderate freeze of –3.9 °C occurred on December 7, 1998. A severe freeze of –7.8 °C occurred on January 6, 1999. Stalk samples were cut for analyses of sucrose content on December 14, 1998, January 14, 1999, and February 2, 1999. The cold-tolerance rating was based on deterioration of juice quality after the freeze damage to mature sugarcane stalks. However, the clones had considerable differences in maturity at the times of the freezes and samples. Level of maturity probably affected degree of cold injury and subsequent deterioration of juice quality.

RESULTS AND DISCUSSION

Table 1 lists the parentage, percentage of fiber, cold tolerance ratings, and reactions to smut, rust, leaf scald, and mosaic diseases for each clone included in these experiments. Tables 2 through 5 contain the results of the CP 94 series plant-cane experiments, and tables 6 through 9 contain the results of the CP 93 series plant-cane experiments. Tables 10 through 12 contain the results of the CP 93 series first-ratoon experiments, and tables 13 and 14 contain the results of the CP 92 series first-ratoon experiments. Tables 15 through 17 contain the results of the CP 92 series second-ratoon experiments, and table 18 contains the results of the CP 91 series second-ratoon experiments. Table 19 lists the dates that stalks were counted in each experiment.

Plant-Cane Crop, CP 94 Series

When averaged across all seven farms, CP 94–1528 and CP 94–2059 yielded significantly more sugar per hectare (TS/H) than CP 70–1133 and all other new clones except CP 94–1100 (table 5). CP 94–1100 yielded significantly more TS/H than CP 70–1133 and all other new clones except CP 94–1628.

CP 94–1528 also yielded significantly more sugar per metric ton of cane (KS/T) than CP 70–1133 (table 4). The mean yield of metric tons of cane per hectare (TC/H) of CP 94–1528 was almost significantly greater than that of CP 70–1133 (table 2). At the Knight, SFCE, and SFCW locations, CP 94–1528 yielded significantly more TC/H than CP 70–1133. The stability-safety index for TS/H of CP 94–1528 was less than that of CP 70–1133 (table 5). This was due to moderate TC/H yields at some locations with organic soils and near average TC/H and KS/T yields on the sand soil at Lykes (tables 2 and 4). CP 94–1528 had a low preharvest KS/T yield, almost significantly lower than that of CP 70–1133 (table 3).

CP 94–2059 had high TC/H yields on organic soils. Its mean TC/H yield, as well as its TC/H yields at five of the six locations with organic soils, were significantly greater than the corresponding TC/H yields of CP 70–1133 (table 2). However, CP 94–2059 had low yields of KS/T. Its harvest KS/T was significantly lower than the KS/T yields of five other new clones, and its preharvest KS/T yield was significantly lower than the KS/T yields of CP 70–1133 and eight other new clones (tables 3 and 4).

CP 94–1100 yielded significantly more KS/T and almost significantly more TC/H than CP 70–1133 (tables 2 and 4). CP 94–1100 had above average yields at most locations with organic soils. However, CP 94–1100 was outstanding on the sand soil at Lykes, where it yielded significantly more TC/H and TS/H than CP 70–1133 (tables 2 and 5). The KS/T yields of CP 94–1100 were below average at Lykes, particularly its preharvest KS/T,

which was significantly less than the preharvest KS/T yields of 8 of the 10 other new clones and CP 70–1133 (tables 3 and 4).

Increases of seed cane of CP 94–1528, CP 94–1100, and CP 94–1340 were begun for potential release (table 1). The TS/H yields of CP 94–1340 and CP 70–1133 were similar. However, CP 94–1528 and CP 94–1100 each yielded significantly more TS/H than CP 94–1340 (table 5). The major yield attribute of CP 94–1340 was its high preharvest and harvest yields of KS/T (tables 3 and 4).

CP 94–2059 had good cold tolerance, CP 94–1528 and CP 94–1100 had fair cold tolerance, and CP 94–1340 had poor cold tolerance (table 1). There are no serious disease concerns for any of these four new clones. However, CP 94–2059, CP 94–1528, and CP 94–1100 have low levels of susceptibility to mosaic. In addition, CP 94–1100 and CP 94–2059 have low susceptibility to leaf scald; CP 94–1528 has low susceptibility to rust; and CP 94–2059 has low susceptibility to smut. An important attribute of CP 94–1340 is that it is resistant to all four diseases listed in table 1. CP 94–1528 and CP 94–2059 had fiber percentages similar to that of CP 70–1133, whereas CP 94–1100 and CP 94–1340 had a moderately low percentage of fiber.

Plant-Cane Crop, CP 93 Series

Last year's report contained the results from five locations of the CP 93 series from the plant-cane crop (Glaz et al. 1999). This year, results are available from five additional locations (tables 6–9). No new clone yielded more TS/H than CP 70–1133. However, CP 93–1634, CP 93–1382, CP 93–1309, and CP 93–1065 had TS/H, TC/H, and KS/T yields similar to those of CP 70–1133 (tables 6, 8, and 9). All four new clones except CP 93–1065 were similarly identified last year in the plant-cane crop (Glaz et al. 1999). Seed cane of all of these new clones except CP 93–1065 is being increased for potential commercial release (table 1).

First-Ratoon Crop, CP 93 Series

No new clone yielded significantly more TS/H than CP 70–1133 (table 12), although CP 93–1634 and CP 93–1596 almost did and had significantly greater TS/H yields than 7 of the 11 new clones (table 12). CP 93–1382 also had high TS/H, significantly greater than the TS/H yields of 6 new clones.

CP 93–1634 had a high mean TC/H yield, although not significantly greater than that of CP 70–1133 (table 10). CP 93–1634 and CP 70–1133 had similar yields of KS/T (table 11). CP 93–1596 yielded significantly more TC/H than CP 70–1133 (table 10), but had a low KS/T yield (table 11). CP 93–1382 did not have significantly different KS/T or TC/H yields than CP 93–1634 and CP 93–1596. However, the KS/T yields of CP 93–1382 were somewhat higher and its TC/H yields were somewhat lower than those of the other two new clones (tables 10 and 11).

Seed cane of CP 93–1634, CP 93–1309, and CP 93–1382 is being increased for potential commercial release (table 1). CP 93–1309, CP 93–1382, CP 93–1065, and CP 93–1596 had fair tolerance to cold temperatures, and CP 93–1634 had poor cold tolerance. One of the strongest characteristics of CP 93–1382 was its resistance to smut, rust, leaf scald, and mosaic. CP 93–1596's susceptibility to leaf scald and mosaic is undetermined. CP 93–1634 had low susceptibility to leaf scald and mosaic. CP 93–1309 had low susceptibility to rust and mosaic. Based on natural infection observed at Eastgate, CP 93–1065 was too susceptible to leaf scald for commercial production in Florida. All five of these new CP 93 clones had moderately low fiber percentages. The fiber percentages of CP 93–1382 and CP 93–1065 were closest to the fiber percentage of CP 70–1133. From CP 93–1634 to CP 93–1309 to CP 93–1596, the fiber percentages were progressively lower.

First-Ratoon Crop, CP 92 Series

Last year's report contained the results from the first-ratoon crop of the CP 92 series from seven

locations (Glaz et al. 1999). This year, results are available from three additional locations (tables 13–14). When averaged across all three locations, no new clone yielded more TS/H than CP 70–1133 (table 14). CP 92–1666, CP 92–1213, and CP 92–1641 were scheduled to be released for commercial production in Florida in 1999 (table 1). CP 92–1666 and CP 92–1213 had TS/H, TC/H, and KS/T yields similar to those of CP 70–1133 (tables 13 and 14). Both new clones had significantly lower TC/H and TS/H yields than CP 70–1133 on the sand soil at Hilliard (table 14). Conversely, CP 92–1666 yielded significantly more TC/H and TS/H than CP 70–1133 on the Torry muck at Eastgate (table 14). The mean TS/H yield across all three locations for CP 92–1641 was significantly less than that of CP 70–1133 (table 14). CP 92–1641 had high KS/T yields (table 13), but low TC/H yields (table 14) at all three locations.

Second-Ratoon Crop, CP 92 Series

When averaged across all seven locations, CP 92–1666 and CP 92–1167 had significantly greater yields of TS/H than CP 70–1133 (table 17). As stated in the previous section, CP 92–1666 was scheduled for commercial release in 1999 (table 1). The high TS/H yield of CP 92–1666 was due primarily to its high TC/H yield, which was significantly greater than that of CP 70–1133 and seven other new clones of the CP 92 series (table 15). The stability-safety index for TC/H for CP 92–1666 was higher than that of any other clone. This was due to its consistently high TC/H yields at all locations except Lykes (table 15). The mean KS/T yield of CP 92–1666 was low, and almost significantly lower than that of CP 70–1133 (table 16). CP 92–1666 yielded similarly at these seven locations in the plant-cane and first-ratoon crops, with the exception that as first ratoon, it also yielded well at Lykes (Glaz et al. 1998, 1999).

CP 92–1167 had mean yields similar to those of CP 92–1666; that is, a high yield of TC/H (table 15) and a low yield of KS/T (table 16) resulting in a high TS/H yield (table 17). Although the KS/T yield of CP 92–1167 was similar to that of CP 92–1666, it was significantly less than that of CP 70–1133 (table 16). CP 92–1167 also had similar yields at these locations in the plant-cane and first-ratoon crops (Glaz et al. 1998, 1999).

CP 92–1213 and CP 92–1641 were also scheduled for commercial release in 1999 (table 1). CP 92–1213 had a mean TS/H yield similar to that of CP 92–1666, but not significantly greater than that of CP 70–1133 (table 17). The TC/H yield and KS/T yields were both lower than, but not significantly different from, those of CP 92–1666 (tables 15 and 16). The TC/H yield of CP 92–1213 was particularly low on the sand soil at Lykes (table 15). CP 92–1213 also had TC/H, KS/T, and TS/H yields similar to those of CP 70–1133 in the plant-cane and first-ratoon crops, with particularly low yields at Lykes (Glaz et al. 1998, 1999).

CP 92–1641 had a lower, but not significantly different, mean TS/H yield than CP 70–1133 (table 17). However, the mean TS/H and TC/H yields of CP 92–1666, CP 92–1167, CP 92–1213, CP 92–1561, and CP 92–1435 were significantly higher than those of CP 92–1641 (tables 15 and 17). The positive characteristic of CP 92–1641 was its KS/T, the mean yield of which was significantly greater than the KS/T yields of eight other CP 92 clones (table 16). The mean TS/H yield at these seven locations for CP 92–1641 was similar to that of CP 92–1666 in the plant-cane crop (Glaz et al. 1998). In the first-ratoon crop, the mean TS/H yield of CP 92–1641 was significantly less than that of CP 92–1666 but still similar to that of CP 92–1213 (Glaz et al. 1999).

Because of its susceptibility to sugarcane rust, CP 92–1167 is no longer being considered for commercial release (table 1). CP 92–1666, CP 92–1213, and CP 92–1641 all have low susceptibility to sugarcane rust. CP 92–1666 has an undetermined level of susceptibility to sugarcane smut, and CP 92–1641 has a low level of susceptibility to leaf scald. CP 92–1666, CP 92–1213, and CP 92–1641 all have fiber contents of about 10 percent. CP 92–1666 and CP 92–1213 have fair tolerance to cold temperatures, and CP 92–1641 has good cold tolerance.

Second-Ratoon Crop, CP 91 Series

Last year's report described the yield results of the CP 91 series clones at seven locations in the second-ratoon crop (Glaz et al. 1999). This year, these clones were tested at Eastgate and Hilliard in the second-ratoon crop (table 18). When averaged across both locations, no clone yielded significantly more TS/H than CP 70–1133. However, CP 91–1238 had a TS/H yield significantly greater than that of CP 70–1133 at Eastgate. CP 91–1883 yielded significantly more TS/H than seven other clones at Eastgate but not significantly more than CP 70–1133. Both CP 91–1238 and CP 91–1883 had high TS/H yields in the first-ratoon crop at Eastgate last year (Glaz et al. 1999) and TS/H yields similar to the TS/H yield of CP 70–1133 in the plant-cane crop at Eastgate 2 years ago (Glaz et al. 1998).

CP 91–1238 had fair cold tolerance and CP 91–1883 had poor cold tolerance (table 1). CP 91–1238 was too susceptible to rust for commercial production in Florida, and CP 91–1883 had low levels of susceptibility to rust, leaf scald, and mosaic. CP 91–1238 had a very low fiber percentage, and CP 91–1883 was moderately low in fiber.

SUMMARY

The CP 94 series was tested for the first time in stage IV this year at seven locations. The three clones with the highest TS/H yields in these plant-cane experiments were CP 94–1100, CP 94–1528, and CP 94–2059. CP 94–1100 and CP 94–1528 had moderately high TC/H yields and high KS/T yields. CP 94–1100 had particularly high TS/H and TC/H yields on the sand soil at Lykes. CP 94–2059 had outstanding TC/H yields but low KS/T yields. CP 94–1340 was also identified as a promising clone because of its moderate TS/H and TC/H yields with high KS/T yields and resistance to smut, rust, leaf scald, and mosaic.

This year, the CP 93 series was tested at five locations in the plant-cane crop and at four locations in the first-ratoon crop. CP 93–1596, CP 93–1634, CP 93–1382, and CP 93–1309 had TS/H yields similar to the TS/H yield of CP 70–1133 when this year's plant-cane and first-ratoon results were combined with last year's plant-cane results at five locations. The main attribute of CP 93–1596 was its high yield of TC/H, and CP 93–1309's main attribute was its high yield of KS/T. CP 93–1634 and CP 93–1382 had TC/H and KS/T yields similar to those of CP 70–1133.

The CP 92 series was tested at three locations in the first-ratoon crop and at seven locations in the second-ratoon crop this year. Last year, this group of clones was tested in the plant-cane crop at three locations and in the first-ratoon crop at seven locations. Two years ago, these clones were tested in the plant-cane crop at seven locations. CP 92–1666 was the only clone without a serious disease problem that yielded more TS/H than CP 70–1133 when results from all of these tests were combined. CP 92–1666 had a higher TC/H yield than CP 70–1133, and the two clones had similar KS/T yields. CP 92–1213 and CP 92–1641 had TS/H yields similar to the TS/H yield of CP 70–1133. CP 92–1213 and CP 70–1133 had nearly identical KS/T and TC/H yields. CP 92–1641 had lower TC/H and higher KS/T yields than CP 70–1133.

Four years of testing of the CP 91 series was completed this year with second-ratoon experiments at two locations. Combining all plant-cane, first-ratoon, and second-ratoon tests from these four years identified CP 91–1914 and CP 91–1924 as two new clones that had TS/H yields similar to the TS/H yield of CP 70–1133. However, both new clones had disease problems that prevent their commercial use in Florida. CP 91–1238 and CP 91–1883 had high TS/H yields on the Torry muck soil at Eastgate each of the three years they were harvested there.

REFERENCES

Deren, C.W. 1995. Genetic base of U.S. mainland sugarcane. Crop Science 35:1195–1199.

Deren, C.W., J. Alvarez, and B. Glaz. 1995. Use of economic criteria for selecting clones in a sugarcane breeding program. Proceedings of the

International Society of Sugar Cane Technologists 21:2, 437–447.

Eskridge, K.M. 1990. Selection of stable cultivars using a safety-first rule. Crop Science 30:369–374.

Glaz, B. 1998. Sugarcane variety census: Florida 1998. Sugar y Azucar 93(12):30–36.

Glaz, B., and J.L. Dean. 1988. Statistical error rates and their implications in sugarcane clone trials. Agronomy Journal 80:560–562.

Glaz, B., J. Alvarez, and J.D. Miller. 1986. Analysis of cultivar-use options with sugarcane as influenced by threats of new pests. Agronomy Journal 78:503–506.

Glaz, B., C.W. Deren, and G.H. Snyder. 1997. Variability of leaf phosphorus among sugarcane genotypes grown on Everglades Histosols. Journal of Environmental Quality 26:1707–1711.

Glaz, B., P.Y.P. Tai, J.C. Comstock, and J.D. Miller. 1998. Evaluation of new Canal Point sugarcane clones: 1996–97 harvest season. U.S. Department of Agriculture, Agricultural Research Service, ARS–146.

Glaz, B., J.C. Comstock, P.Y.P. Tai, et al. 1999. Evaluation of new Canal Point sugarcane clones: 1997–98 harvest season. U.S. Department of Agriculture, Agricultural Research Service, ARS–151.

Hall, D.G. 1991. Sugarcane lace bug *Leptodictya tabida*, an insect pest new to Florida. Florida Entomologist 74:148–149.

Legendre, B.L. 1992. The core/press method for predicting the sugar yield from cane for use in cane payment. Sugar Journal 54(9):2–7.

Lockhart, B.E.L., M.J. Irey, and J.C. Comstock. 1996. Sugarcane bacilliform virus, sugarcane mild mosaic virus and sugarcane yellow leaf syndrome. *In* B.J. Croft, C.M. Piggin, E.S. Wallis, and D.M. Hogarth, eds., Sugarcane Germplasm Conservation and Exchange. Proceedings No. 67. Australian Centre for International Agricultural Research, Canberra.

Mangelsdorf, A.J. 1983. Cytoplasmic diversity in relation to pests and pathogens. Sugarcane Breeders' Newsletter 45:45–49.

McCollum, S.H., V.W. Carlisle, and B.G. Volk. 1976. Historical and current classification of organic soils in the Florida Everglades. Soil and Crop Science Society of Florida Proceedings 35:173–177.

McIntosh, M.S. 1983. Analysis of combined experiments. Agronomy Journal 75:153–155.

Shukla, G.K. 1972. Some statistical aspects of partitioning genotype-environmental components of variability. Heredity 29:237–245.

Sosa, O., Jr. 1995. The West Indian cane weevil and the sugarcane rootstalk borer weevil: Likely pests of sugarcane in Florida. Sugar Journal 58(1):27–29.

Sosa, O., Jr. 1996. Breeding for leaf pubescence in sugarcane to control borers. Abstract. Sugar y Azucar 91(6):30

Tai, P.Y.P., and J.D. Miller. 1989. Family performance at early stages of selection and frequency of superior clones from crosses among Canal Point cultivars of sugarcane. Journal of American Society of Sugar Cane Technologists 9:62–70.

Table 1. Parentage, fiber content, and ratings of cold tolerance and susceptibility to smut, rust, leaf scald, and mosaic for CP 70–1133 and 45 new sugarcane clones.

				Rating*			
Clone	Parentage	Percent fiber	Cold tolerance†	Smut	Rust	Leaf scald	Mosaic
CP 70–1133‡	67 P 6 CP 56–63§	10.37	P	R	U	L	R
CP 91–1062	88 P 9 CP 83–1281§	9.63	P	L	L	L	R
CP 91–1150	88 P 7 CP 80–1827§	10.23	P	U	L	U	U
CP 91–1238	88 P 7 CP 70–1133§	8.79	F	R	S	R	R
CP 91–1560	CP 86–1791 × CP 82–2043	9.86	F	L	L	R	U
CP 91–1865	88 P 17 CP 81–1425§	10.25	F	L	S	U	R
CP 91–1880	CP 82–2043 × CP 84–1322	10.41	P	U	L	L	R
CP 91–1883	CP 80–1827 × CP 84–1322	9.95	P	R	L	L	L
CP 91–1914	88 P 17 CP 80–1827§	9.66	F	U	S	L	R
CP 91–1924	CP 86–1791 × CP 81–2149	9.52	P	R	L	U	R
CP 91–1980	CP 62–374 × CP 84–1322	9.87	P	R	L	L	U
CP 91–2246	CP 77–1776 × CP 56–59	10.83	F	R	U	S	R
CP 92–1167	CP 84–1591 × SP 70–1143	10.54	G	U	S	L	L
CP 92–1213‡	CL 73–239 × CP 85–1498	10.32	F	R	L	R	R
CP 92–1320	89 P 5 CP 85–1211§	10.07	F	U	L	R	R
CP 92–1435	CP 70–1133 × CP 72–2086	11.28	G	R	L	L	S
CP 92–1561	CP 82–2043 × CP 70–1133	9.95	F	R	L	R	L
CP 92–1607	CL 61–620 × CP 82–2043	8.76	F	R	L	L	U
CP 92–1640	CP 80–1827 × CP 84–1322	10.47	G	R	R	R	L
CP 92–1641‡	CP 80–1827 × CP 84–1322	10.24	G	R	L	L	R
CP 92–1647	CP 80–1827 × CP 84–1322	9.44	F	L	L	L	S
CP 92–1666‡	CP 82–1592 × CP 84–1322	9.91	F	U	L	R	R
CP 92–1684	CP 84–1714 × CP 80–1827	10.43	F	R	U	R	U
CP 93–1017	CP 84–1591 × CP 86–1206	11.12	G	R	S	R	R
CP 93–1065	CP 78–1610 × CP 89–2178	10.13	F	R	R	S	R
CP 93–1309‖	CP 81–1238 × CP 72–2086	9.39	F	R	L	R	L
CP 93–1361	90 P 19 CP 84–1591§	10.59	P	S	R	R	R
CP 93–1382‖	CP 82–2043 × CL 73–239	10.10	F	R	R	R	R
CP 93–1544	CP 89–2372 × LCP 82–89	11.20	F	L	R	L	L
CP 93–1548	CP 89–2372 × LCP 82–89	10.92	F	R	R	L	L
CP 93–1555	CP 89–2372 × LCP 82–89	10.31	F	R	R	U	U
CP 93–1596	91 P 13 CP 84–1714§	9.09	F	R	R	U	U
CP 93–1634‖	CP 83–1969 × CP 71–1240	9.68	P	R	R	L	L
CP 93–1688	CP 82–1172 × CP 86–1633	10.81	P	R	R	R	L
CP 94–1100‖	CP 81–1238 × CP 88–2045	9.70	F	R	R	L	L
CP 94–1200	CP 83–1969 × CP 80–1743	10.72	F	R	S	L	R
CP 94–1292	CP 89–2375 × CP 89–2335	10.66	P	R	R	L	R
CP 94–1340‖	CP 87–1733 × CP 86–1665	9.80	P	R	R	R	R
CP 94–1447	CP 71–1240 × CP89–2335	11.01	F	R	R	L	R
CP 94–1528‖	91 P 13 72–2086§	10.21	F	R	L	R	L
CP 94–1607	CP 87–1733 × CP 85–1491	11.24	G	R	R	L	R
CP 94–1628	CP 78–1628 × CP 85–1491	12.10	F	R	S	R	R
CP 94–1855	CP 87–1733 × Pelorus	10.82	F	R	R	R	L
CP 94–2059	CP 87–1475 × CP 85–1308	10.34	G	L	R	L	L
CP 94–2095	CP 87–1737 × CP 72–1210	9.98	F	R	R	L	L

* R = resistant enough for commercial production; L = low levels of disease susceptibility; S = too susceptible for production; U = undetermined susceptibility (available data not sufficient to determine the level of susceptibility).

† P = poor freeze tolerance; F = fair freeze tolerance; G = good freeze tolerance; U = unknown freeze tolerance.

‡ Released for commercial production in Florida.

§ 67 P 6 = 6th polycross made in 1967 crossing season. Female parent (CP 56–63) exposed to pollen from many clones; therefore, male parent of CP 70–1133 unknown. Similar explanations for CP 91–1062, CP 91–1150, CP 91–1238, CP 91–1865, CP 91–1914, CP 92–1320, CP 93–1361, CP 93–1596, and CP 94–1528.

‖ Seed cane currently being increased by Florida Sugar Cane League, Inc., for potential release.

Table 2. Yields of cane (in metric tons per hectare—TC/H) from plant cane on Lauderhill muck, Pahokee muck, Terra Ceia muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Lauderhill muck		Pahokee muck			Terra Ceia muck	Pompano fine sand		
Clone	Wedgworth 1/26/99	Okee-lanta 1/28/99	Knight 12/28/98	SFCE 1/11/99	Duda 2/11/99	SFCW 1/7/99	Lykes 12/21/98	Stability-safety index*	Mean yield, all farms
CP 94-2059	213.50	223.17	238.26	207.26	181.70	227.59	183.91	52.60	210.77
CP 94-1100	189.43	189.78	183.93	202.28	153.96	210.28	213.02	24.11	191.81
CP 94-1528	184.20	175.41	199.04	222.02	161.22	228.29	167.00	24.38	191.03
CP 94-1447	197.62	184.59	211.85	211.57	158.98	201.02	154.82	27.27	188.63
CP 94-1607	161.00	206.97	200.14	199.09	159.81	198.34	191.20	14.21	188.08
CP 94-1628	224.58	186.19	201.99	191.89	158.57	186.22	164.24	−1.20	187.67
CP 94-1200	187.20	164.22	194.75	167.23	152.55	217.60	192.65	5.32	182.32
CP 70-1133	191.69	175.42	179.70	197.34	159.14	188.96	168.59	36.84	180.12
CP 94-2095	162.28	194.78	182.23	179.79	135.02	204.42	175.87	23.29	176.34
CP 94-1292	177.85	152.96	180.01	192.61	134.83	203.99	169.28	26.53	173.08
CP 94-1340	155.71	165.56	174.19	167.26	122.92	196.89	153.49	27.99	162.29
CP 94-1855	163.97	167.83	159.71	171.49	106.85	172.52	141.92	13.56	154.90
Mean	184.09	182.24	192.15	192.49	148.80	203.01	173.00	22.91	182.25
LSD† (p=0.1)	18.07	20.65	5.74	21.93	18.93	22.18	30.80		12.36
CV‡(%)	11.79	13.61	6.36	13.69	15.29	13.13	21.39		15.26

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 10.93 TC/H at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 3. Preharvest theoretical recoverable yields of 96° sugar (in kg per metric ton of cane—KS/T) from plant cane on Lauderhill muck, Pahokee muck, Terra Ceia muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Lauderhill muck		Pahokee muck			Terra Ceia muck	Pompano fine sand		
Clone	Wedgworth 10/22/98	Okee-lanta 10/28/98	Knight 10/21/98	SFCE 10/19/98	Duda 10/15/98	SFCW 10/22/98	Lykes 10/16/98	Stability-safety index*	Mean yield, all farms
CP 94-1340	93.0	113.5	101.4	91.9	79.2	97.9	114.8	59.8	98.8
CP 94-1292	98.1	92.8	106.3	81.8	89.7	90.2	105.3	63.6	94.9
CP 94-1855	91.7	91.9	100.1	98.8	87.7	81.5	108.3	58.6	94.3
CP 94-1628	99.1	96.3	86.7	79.5	93.4	80.9	122.0	50.5	94.0
CP 70-1133	92.3	93.6	102.8	83.5	96.6	82.5	99.2	61.0	92.9
CP 94-2095	91.0	93.7	93.3	84.3	89.2	81.9	109.5	65.5	91.9
CP 94-1200	90.7	101.2	96.0	71.8	87.2	89.7	105.4	60.2	91.7
CP 94-1100	94.4	96.6	96.6	87.4	84.2	94.9	83.6	47.8	91.1
CP 94-1447	86.5	103.3	95.8	66.4	81.3	87.6	108.1	50.4	89.9
CP 94-1528	84.8	91.1	93.7	68.7	86.9	78.9	103.0	55.8	86.7
CP 94-1607	84.0	100.0	75.3	96.7	79.5	79.8	82.5	33.1	85.4
CP 94-2059	77.2	82.3	76.2	84.0	80.2	72.3	89.3	46.6	80.2
Mean	90.2	96.4	93.7	82.9	86.3	84.8	102.6	54.4	91.0
LSD† (p=0.1)	17.4	12.5	13.0	2.8	17.2	7.5	14.2		6.9
CV‡ (%)	10.7	7.2	7.7	14.6	11.1	4.9	7.7		9.4

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 5.82 KS/T at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 4. Theoretical recoverable 96° sugar (in kg per metric ton of cane—KS/T) from plant cane on Lauderhill muck, Pahokee muck, Terra Ceia muck, and Pompano fine sand

Clone	Mean yield by soil type, farm, and sampling date							Stability-safety index*	Mean yield, all farms
	Lauderhill muck		Pahokee muck			Terra Ceia muck	Pompano fine sand		
	Wedgworth 1/26/99	Okeelanta 1/28/99	Knight 12/28/98	SFCE 1/11/99	Duda 2/11/99	SFCW 1/7/99	Lykes 12/21/98		
CP 94-1528	115.3	117.3	118.4	121.0	117.4	115.9	122.5	78.9	118.3
CP 94-1340	115.5	116.2	119.4	116.3	114.3	118.5	123.4	75.1	117.6
CP 94-2095	110.8	113.3	115.5	121.1	106.3	113.1	119.9	69.6	114.3
CP 94-1100	110.3	117.2	111.7	116.1	114.8	111.1	117.2	70.0	114.1
CP 94-1855	108.5	112.2	111.8	118.2	109.4	109.0	119.3	75.1	112.6
CP 94-1292	103.4	102.6	108.2	117.1	111.2	112.4	114.4	65.5	109.9
CP 94-1628	100.2	100.1	109.4	122.6	110.7	99.6	122.2	47.1	109.2
CP 94-1200	107.5	109.4	106.4	93.9	111.5	113.1	122.5	35.2	109.2
CP 70-1133	100.9	99.7	110.3	118.6	101.2	110.3	119.2	56.9	108.6
CP 94-2059	99.2	108.3	92.1	105.4	107.4	108.0	119.4	49.1	105.7
CP 94-1607	92.2	102.7	98.0	106.9	109.5	102.7	119.9	54.5	104.5
CP 94-1447	93.0	103.6	100.6	109.6	97.2	104.8	122.1	54.1	104.4
Mean	104.7	108.5	108.5	113.9	109.2	109.9	120.2	60.9	110.7
LSD† (p=0.1)	6.6	5.9	5.7	7.8	7.6	6.3	11.4		4.6
CV‡ (%)	7.6	6.5	6.4	8.2	8.3	6.9	11.4		8.2

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 2.51 KS/T at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 5. Theoretical recoverable yields of 96° sugar (in metric tons per ha—TS/H) from plant cane on Lauderhill muck, Pahokee muck, Terra Ceia muck, and Pompano fine sand.

	Mean yield by soil type, farm, and sampling date								
	Lauderhill muck		Pahokee muck			Terra Ceia muck	Pompano fine sand		
Clone	Wedgworth 1/26/99	Okee-lanta 1/28/99	Knight 12/28/98	SFCE 1/11/99	Duda 2/11/99	SFCW 1/7/99	Lykes 12/21/98	Stability-safety index*	Mean yield, all farms
CP 94-1528	21.228	20.530	23.556	26.927	18.929	26.441	20.389	2.575	22.571
CP 94-2059	21.253	24.061	21.899	22.038	19.823	24.658	21.694	4.009	22.204
CP 94-1100	20.851	22.212	20.719	23.574	17.624	23.432	25.002	4.518	21.916
CP 94-1628	22.475	18.623	22.214	23.465	17.486	18.621	20.215	−2.412	20.443
CP 94-2095	17.900	22.049	21.087	21.790	14.393	23.188	21.246	2.604	20.236
CP 94-1200	20.173	17.927	20.739	16.036	17.059	24.503	23.375	−7.155	19.973
CP 94-1607	14.826	21.342	19.617	21.244	17.521	20.399	22.878	−3.283	19.690
CP 70-1133	19.181	17.471	19.943	23.323	16.214	20.846	20.180	3.007	19.594
CP 94-1447	18.286	19.145	21.363	23.218	15.465	21.101	18.565	3.104	19.592
CP 94-1340	18.037	19.277	20.808	19.443	14.115	23.405	18.944	2.011	19.147
CP 94-1292	18.358	15.651	19.540	22.373	15.011	22.841	19.290	0.639	19.009
CP 94-1855	17.759	18.784	17.848	20.279	11.657	18.828	17.074	0.002	17.461
Mean	19.194	19.756	20.778	21.976	16.275	22.355	20.738	0.801	20.153
LSD† (p=0.1)	2.219	2.467	3.285	3.106	2.589	3.009	4.434		1.633
CV‡ (%)	13.888	14.999	18.989	16.977	19.112	16.168	25.684		18.422

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 1.14 TS/H at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 6. Preharvest theoretical recoverable yields of 96° sugar (in kg per metric ton of cane—KS/T) from plant cane on Lauderhill muck, Pahokee muck, Torry muck, Pompano fine sand, and Malabar sand

	Mean yield by soil type, farm, and sampling date						
	Lauderhill muck	Pahokee muck	Torry muck	Pompano fine sand	Malabar sand		
Clone	Okeelanta 10/28/98	SFCE 10/19/98	Eastgate 10/15/98	Lykes 10/16/98	Hilliard 10/16/98	Stability-safety index*	Mean yield, all farms
CP 93-1544	118.6	105.2	104.1	110.2	104.5	75.2	108.5
CP 93-1555	113.0	96.2	115.0	115.3	98.3	76.2	107.5
CP 93-1548	115.4	97.9	106.4	90.6	114.2	59.3	104.9
CP 93-1309	120.0	88.5	118.6	112.2	84.6	52.2	104.8
CP 93-1634	104.0	86.8	96.3	112.4	106.8	62.8	101.3
CP 93-1688	112.4	71.2	93.7	113.5	112.5	42.0	100.7
CP 93-1017	110.2	89.8	94.4	91.5	97.9	64.0	96.8
CP 70-1133	116.4	72.4	98.4	102.3	92.6	54.1	96.4
CP 93-1065	97.8	84.3	100.0	92.8	98.4	67.4	94.7
CP 93-1361	106.8	79.0	97.9	89.4	85.6	62.0	91.8
CP 93-1382	73.8	81.5	116.4	92.6	88.3	20.8	90.5
CP 93-1596	91.9	91.2	91.2	82.1	88.5	48.0	89.0
Mean	106.7	87.0	102.7	100.4	97.7	57.0	98.9
LSD† (p=0.1)	18.6	23.0	13.3	23.6	11.7		12.6
CV‡ (%)	9.7	14.7	7.2	13.1	6.7		10.5

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 7.40 KS/T at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 7. Theoretical recoverable yields of 96° sugar (in kg per metric tons of cane—KS/T) from plant cane on Lauderhill muck, Pahokee muck, Torry muck, Pompano fine sand, and Malabar sand

	Mean yield by soil type, farm, and sampling date						
	Lauderhill muck	Pahokee muck	Torry muck	Pompano fine sand	Malabar sand		
Clone	Okeelanta 2/02/99	SFCE 1/12/99	Eastgate 3/10/99	Lykes 11/26/98	Hilliard 12/23/98	Stability-safety index	Mean yield, all farms
CP 93-1548	121.0	127.6	123.3	119.8	134.9	58.5	125.3
CP 93-1309	119.5	119.1	131.6	116.0	130.7	55.2	123.4
CP 93-1688	113.2	118.0	125.4	114.8	130.6	60.2	120.4
CP 93-1555	114.5	115.1	120.0	117.9	134.0	57.4	120.3
CP 93-1544	112.3	121.6	121.8	109.7	134.5	56.7	120.0
CP 93-1065	114.6	116.4	122.9	109.5	136.0	57.2	119.9
CP 70-1133	111.1	112.3	123.0	116.9	134.3	55.6	119.5
CP 93-1634	111.2	111.5	121.2	117.1	134.7	54.0	119.1
CP 93-1382	102.2	119.9	129.9	105.1	128.4	33.4	117.1
CP 93-1596	106.8	115.5	119.1	101.9	120.1	42.4	112.7
CP 93-1017	105.2	109.0	105.5	110.6	132.3	35.2	112.5
CP 93-1361	104.0	105.9	110.6	107.8	126.9	48.0	111.0
Mean	111.3	116.0	121.2	112.3	131.5	51.1	118.4
LSD† (p=0.1)	7.0	5.3	9.2	9.5	6.9		4.7
CV‡ (%)	7.6	5.5	9.1	10.2	6.3		7.9

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 2.8 KS/T at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 8. Yields of cane (in metric tons per ha—TC/H) from plant cane on Lauderhill muck, Pahokee muck, Torry muck, Pompano fine sand, and Malabar sand

	Mean yield by soil type, farm, and sampling date						
	Lauderhill muck	Pahokee muck	Torry muck	Pompano fine sand	Malabar sand		
Clone	Okeelanta 2/02/99	SFCE 1/12/99	Eastgate 03/10/99	Lykes 11/26/98	Hilliard 12/23/98	Stability-safety index*	Mean yield, all farms
CP 93-1596	168.36	135.20	235.25	148.30	131.35	−211.12	163.69
CP 70-1133	146.14	202.08	200.58	150.85	118.50	−196.94	163.63
CP 93-1634	143.17	173.40	248.81	114.30	105.26	−240.44	156.99
CP 93-1382	132.25	156.92	249.16	139.08	97.43	−196.69	154.97
CP 93-1065	109.08	180.77	206.73	149.70	92.28	−193.35	147.71
CP 93-1309	104.64	170.95	227.31	109.12	115.83	−190.64	145.57
CP 93-1548	111.13	174.17	209.76	113.07	88.76	−207.21	139.38
CP 93-1361	115.26	136.95	231.03	109.37	96.85	−194.66	137.89
CP 93-1555	105.23	140.27	236.46	107.33	94.33	−213.42	136.72
CP 93-1544	95.63	170.33	185.38	138.35	92.57	−190.99	136.45
CP 93-1688	92.23	177.40	166.04	120.63	84.80	−248.28	128.22
CP 93-1017	83.23	130.72	174.00	141.68	107.96	−228.82	127.52
Mean	117.20	162.43	214.21	128.48	102.16	−209.38	144.90
LSD† (p=0.1)	18.40	17.73	31.66	21.50	15.77		21.52
CV‡ (%)	18.86	13.12	17.76	20.10	18.54		18.04

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 11.45 TC/H at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 9. Theoretical recoverable yields of 96° sugar (in metric tons per ha—TS/H) from plant cane on Lauderhill muck, Pahokee muck, Torry muck, Pompano fine sand, and Malabar sand

	Mean yield by soil type, farm, and sampling date						
	Lauderhill muck	Pahokee muck	Torry muck	Pompano fine sand	Malabar sand		
Clone	Okeelanta 2/02/99	SFCE 1/12/99	Eastgate 3/10/99	Lykes 11/26/98	Hilliard 12/23/98	Stability-safety index*	Mean yield, all farms
CP 70-1133	16.212	22.583	24.578	17.611	15.823	−23.428	19.361
CP 93-1634	15.869	19.370	30.340	13.587	14.111	−23.903	18.655
CP 93-1596	18.064	15.737	28.129	15.200	15.822	−27.479	18.590
CP 93-1382	13.500	18.737	32.424	14.400	12.496	−27.543	18.311
CP 93-1309	12.390	20.354	30.132	12.713	15.047	−25.033	18.127
CP 93-1065	12.546	21.010	25.442	16.184	12.461	−23.469	17.529
CP 93-1548	13.401	22.270	25.932	13.631	12.004	−24.536	17.448
CP 93-1555	12.030	16.178	28.656	12.675	12.635	−26.034	16.435
CP 93-1544	10.809	20.713	22.558	15.214	12.457	−26.598	16.350
CP 93-1688	10.403	20.926	20.827	13.877	11.098	−29.370	15.426
CP 93-1361	11.956	14.540	25.592	11.754	12.321	−26.093	15.233
CP 93-1017	8.673	14.288	17.869	15.579	14.282	−36.518	14.138
Mean	12.988	18.892	26.040	14.369	13.380	−26.667	17.134
LSD† (p=0.1)	2.141	2.201	4.687	2.460	2.105		2.704
CV‡ (%)	19.800	13.998	21.622	20.564	18.900		20.291

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 1.32 TS/H at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 10. Yield of cane (in metric tons per ha—TC/H) from first-ratoon cane on Dania muck and Pahokee muck

	Mean yield by soil type, farm, and sampling date				
	Dania muck		Pahokee muck		
Clone	Knight 12/09/98	Okeelanta 01/14/99	Duda 01/05/99	Wedgworth 01/25/99	Mean yield, all farms
CP 93-1596	183.09	175.81	231.37	177.52	191.95
CP 93-1634	181.36	154.38	232.79	186.75	188.82
CP 93-1382	146.31	140.00	269.66	165.72	180.42
CP 93-1065	151.59	146.28	210.45	158.00	166.58
CP 70-1133	105.14	169.97	199.30	180.21	163.66
CP 93-1017	152.97	136.30	168.02	149.94	151.81
CP 93-1544	202.46	133.00	162.16	99.70	149.33
CP 93-1548	134.06	126.95	198.63	134.96	148.65
CP 93-1555	134.70	126.02	191.59	140.23	148.13
CP 93-1361	131.33	115.76	226.50	115.64	147.31
CP 93-1309	139.01	131.28	196.37	108.69	143.84
CP 93-1688	123.43	118.01		138.27	126.57
Mean	148.79	139.48	207.89	146.30	159.61
*LSD** (p=0.1)	17.42	17.34	26.25	17.49	27.53
CV† (%)	14.06	14.93	15.35	14.44	15.05

* *LSD* for location means = 7.9 TC/H at $p = 0.10$.
† *CV* = coefficient of variation.

Table 11. Theoretical recoverable yields of 96° sugar (in kg per metric ton of cane—KS/T) from first-ratoon cane on Dania muck and Pahokee muck

	Mean yield by soil type, farm, and sampling date				
	Dania muck		Pahokee muck		
Clone	Knight 12/09/98	Okeelanta 01/14/99	Duda 01/05/99	Wedgworth 01/25/99	Mean yield, all farms
CP 93-1309	124.3	117.3	119.4	125.7	121.7
CP 93-1065	112.0	119.9	110.9	119.1	115.5
CP 93-1555	112.7	119.1	110.0	116.4	114.6
CP 93-1548	121.9	115.7	102.4	114.4	113.6
CP 93-1382	113.1	102.2	114.7	120.8	112.7
CP 93-1017	111.6	115.2	108.2	113.7	112.2
CP 70-1133	114.2	116.0	105.0	112.3	111.9
CP 93-1634	112.9	116.4	101.3	116.7	111.8
CP 93-1596	105.0	110.7	102.4	112.9	107.7
CP 93-1688	111.5	114.3	101.8	103.3	107.7
CP 93-1544	100.0	113.0	107.6	109.1	107.4
CP 93-1361	107.1	106.4	100.8	104.3	104.6
Mean	112.2	113.9	107.0	114.1	111.8
LSD * (p=0.1)	5.4	5.9	6.8	5.1	5.5
CV† (%)	5.8	6.2	7.7	5.4	6.3

* *LSD* for location means = 2.15 KS/T at $p = 0.10$.
† *CV* = coefficient of variation.

Table 12. Theoretical recoverable yields of 96° sugar (in metric tons per ha of cane—TS/H) from first-ratoon cane on Dania muck and Pahokee muck

	Mean yield by soil type, farm, and sampling date				
	Dania muck		Pahokee muck		
Clone	Knight 12/09/98	Okeelanta 01/14/99	Duda 01/05/99	Wedgworth 01/25/99	Mean yield, all farms
CP 93-1634	20.427	17.962	23.587	21.795	20.943
CP 93-1596	19.261	19.473	23.761	20.040	20.634
CP 93-1382	16.506	14.217	30.840	20.021	20.396
CP 93-1065	17.036	17.621	23.180	18.835	19.168
CP 70-1133	12.004	19.818	20.830	20.253	18.226
CP 93-1309	17.221	15.429	23.484	13.658	17.448
CP 93-1017	17.070	15.713	18.160	17.028	16.993
CP 93-1555	15.148	15.007	21.001	16.323	16.870
CP 93-1548	16.401	14.724	20.392	15.428	16.736
CP 93-1544	20.297	15.001	17.507	10.915	15.930
CP 93-1361	14.062	12.316	22.883	12.073	15.333
CP 93-1688	13.825	13.460		14.331	13.872
Mean	16.605	15.895	22.329	16.725	17.794
LSD * (p=0.1)	2.037	2.279	3.062	2.183	3.122
CV† (%)	14.733	17.223	16.476	15.680	16.359

* *LSD* for location means = 0.89 TS/H at p = 0.10.
† *CV* = coefficient of variation.

Table 13. Theoretical recoverable yields of 96° sugar (in kg per metric ton of cane—KS/T) from first-ratoon cane on Lauderhill muck, Torry muck, and Malabar sand

	Mean yield by soil type, farm, and sampling date			
	Lauderhill muck	Torry muck	Malabar sand	
Clone	Okeelanta 1/14/99	Eastgate 3/11/99	Hilliard 11/27/98	Mean yield, all farms
CP 92-1641	134.0	128.3	133.9	132.1
CP 92-1561	130.0	131.2	129.7	130.3
CP 92-1647	127.7	122.0	134.4	128.0
CP 92-1320	126.9	128.0	126.0	127.0
CP 92-1435	120.8	126.9	131.4	126.4
CP 92-1213	127.0	125.4	125.3	125.9
CP 92-1640	124.5	118.2	131.5	124.7
CP 70-1133	124.7	125.8	123.5	124.6
CP 92-1607	124.6	120.2	127.0	123.9
CP 92-1684	121.1	124.0	121.4	122.1
CP 92-1167	122.2	117.6	121.9	120.6
CP 92-1666	110.1	126.1	123.7	120.0
Mean	124.5	124.5	127.5	125.5
LSD * (p=0.1)	10.3	5.1	7.3	5.7
CV† (%)	9.9	4.9	6.9	7.5

* *LSD* for location means = 2.2 KS/T at p = 0.10.
† *CV* = coefficient of variation.

Table 14. Yields of cane and of theoretical recoverable 96° sugar (in metric tons per ha—TC/H and TS/H) from first-ratoon cane on Lauderhill muck, Torry muck, and Malabar sand

	Cane yield by soil type, farm, and sampling date				Sugar yield by soil type, farm and sampling date			
	Lauderhill muck	Torry muck	Malabar sand		Lauderhill muck	Torry muck	Malabar sand	
Clone	Okeelanta 1/14/99	Eastgate 3/11/99	Hilliard 11/27/98	Mean yield, all farms	Okeelanta 1/14/99	Eastgate 3/11/99	Hilliard 11/27/98	Mean yield, all farms
CP 70-1133	165.60	171.38	82.06	139.68	20.678	21.439	10.109	17.408
CP 92-1167	169.50	180.49	73.24	141.07	20.784	21.223	8.861	16.956
CP 92-1213	158.40	178.47	37.46	124.78	20.137	22.599	4.706	15.814
CP 92-1320	136.96	160.08	34.19	110.41	17.400	20.297	4.387	14.028
CP 92-1435	157.24	198.30	36.76	130.77	19.010	25.127	4.846	16.328
CP 92-1561	158.94	157.76	70.04	128.91	20.635	20.702	9.099	16.812
CP 92-1607	146.18	153.37	54.90	118.15	18.135	18.504	6.983	14.541
CP 92-1640	158.00	149.83	49.52	119.11	19.687	17.737	6.582	14.669
CP 92-1641	134.89	145.59	48.33	109.60	18.039	18.722	6.405	14.389
CP 92-1647	121.93	159.19	49.08	110.07	15.561	19.412	6.581	13.851
CP 92-1666	161.67	206.16	52.70	140.18	18.029	25.827	6.576	16.811
CP 92-1684	149.51	151.93	60.50	120.64	18.009	18.814	7.396	14.740
Mean	151.57	167.71	54.06	124.45	18.842	20.867	6.878	15.529
LSD * (p=0.1)	16.54	26.66	14.53	31.89	2.589	3.369	1.881	2.694
CV† (%)	13.11	19.10	32.30	19.27	16.506	19.395	32.85	20.753

* *LSD* for location means of cane yield = 11.67 TC/H and of sugar yield = 1.48 TS/H at $p = 0.10$.
† *CV* = coefficient of variation.

Table 15. Yields of cane (in metric tons per ha—TC/H) from second-ratoon cane on Dania muck, Lauderhill muck, Pahokee muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck		Pahokee muck			Pompano fine sand		
Clone	Okee-lanta 10/13/98	SFCW 10/14/98	Duda 11/24/98	Knight 10/02/98	SFCE 10/20/98	Wedg-worth 12/29/98	Lykes 10/23/98	Stability-safety index*	Mean yield, all farms
CP 92-1167	138.55	182.74	157.37	170.87	163.56	186.22	100.73	−15.24	157.15
CP 92-1666	138.69	177.03	156.40	161.65	170.98	177.37	99.72	−6.61	154.55
CP 92-1435	119.27	165.82	167.33	154.40	152.64	158.14	87.73	−11.01	143.62
CP 92-1213	130.33	148.60	161.89	148.89	157.22	168.83	84.27	−27.60	142.86
CP 92-1684	111.44	149.98	164.84	126.45	172.25	126.70	105.98	−46.19	136.81
CP 92-1561	116.92	140.61	147.41	134.84	139.61	114.47	124.92	−42.53	131.25
CP 70-1133	99.47	145.61	130.35	130.19	157.40	136.17	109.36	−29.83	129.63
CP 92-1640	99.57	140.80	142.88	157.32	117.54	124.89	89.95	−36.76	124.71
CP 92-1607	90.56	150.87	128.86	113.38	109.14	125.20	109.06	−54.86	118.15
CP 92-1641	87.45	137.66	120.47	135.56	125.37	118.62	96.18	−29.11	117.33
CP 92-1320	93.39	131.92	149.70	127.61	101.07	127.95	81.36	−46.09	116.14
CP 92-1647	113.23	87.13	83.42	81.54	77.96	70.86	67.85	−148.19	83.14
Mean	111.57	146.56	142.58	136.89	137.06	136.29	96.42	−41.17	129.63
LSD† (p=0.1)	32.62	19.84	26.70	20.72	20.43	20.52	19.15		13.76
CV‡ (%)	35.12	16.26	22.49	18.18	17.90	18.09	23.86		21.60

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 11.09 TC/H at p =0.10.

‡ *CV* = coefficient of variation.

Table 16. Theoretical recoverable yields of 96° sugar (in kg per metric ton of cane—KS/T) from second-ratoon cane on Dania muck, Lauderhill muck, Pahokee muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck		Pahokee muck			Pompano fine sand		
Clone	Okee-lanta 10/13/98	SFCW 10/14/98	Duda 11/24/98	Knight 10/02/98	SFCE 10/20/98	Wedg-worth 12/29/98	Lykes 10/23/98	Stability-safety index*	Mean yield, all farms
CP 92-1561	116.3	116.5	116.6	99.7	118.5	116.9	114.5	55.3	114.1
CP 92-1641	110.5	104.2	122.1	105.1	111.8	123.2	120.2	62.0	113.9
CP 92-1607	101.5	108.4	117.8	100.9	114.8	117.0	106.4	50.7	109.5
CP 70-1133	101.2	109.6	113.9	96.1	117.8	116.7	109.7	50.7	109.3
CP 92-1647	106.1	98.6	105.6	94.9	107.9	118.0	115.1	58.3	106.6
CP 92-1320	106.3	105.2	110.5	96.3	100.6	115.4	108.6	57.8	106.1
CP 92-1640	104.4	102.0	100.7	96.5	111.1	115.5	111.2	55.6	105.9
CP 92-1666	108.8	94.6	105.4	94.9	106.1	116.8	108.6	54.4	105.1
CP 92-1213	103.9	88.2	109.5	100.3	107.8	116.1	108.3	42.7	104.9
CP 92-1435	96.9	99.4	109.2	95.1	106.0	114.8	109.6	57.4	104.4
CP 92-1167	96.7	102.8	105.5	88.4	104.5	116.0	102.5	51.4	102.3
CP 92-1684	105.4	103.7	85.7	98.3	79.0	117.4	109.5	−10.0	99.8
Mean	104.8	102.8	108.5	97.2	107.2	117.0	110.4	48.9	106.8
LSD† (p=0.1)	6.4	7.3	7.9	7.2	2.1	6.4	5.9		5.1
CV‡ (%)	7.3	8.6	8.8	8.9	9.5	6.6	6.4		8.0

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 3.37 KS/T at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 17. Theoretical recoverable yields of 96° sugar (in metric tons per ha—TS/H) from second-ratoon cane on Dania muck, Lauderhill muck, Pahokee muck, and Pompano fine sand

	Mean yield by soil type, farm, and sampling date								
	Dania muck	Lauderhill muck		Pahokee muck			Pompano fine sand		
Clone	Okee-lanta 10/13/98	SFCW 10/14/98	Duda 11/24/98	Knight 10/02/98	SFCE 10/20/98	Wedg-worth 12/29/98	Lykes 10/23/98	Stability-safety index*	Mean yield, all farms
CP 92-1666	15.211	16.691	16.665	15.300	18.022	20.672	10.962	−2.027	16.217
CP 92-1167	13.398	18.739	16.654	15.191	17.010	21.666	10.305	−4.369	16.138
CP 92-1213	13.646	13.126	18.094	14.986	16.885	19.544	9.193	−6.489	15.068
CP 92-1435	11.557	16.457	18.299	14.754	16.246	18.165	9.658	−2.147	15.019
CP 92-1561	13.627	16.486	17.176	13.432	16.436	13.406	14.329	−5.437	14.984
CP 70-1133	10.204	16.209	14.757	12.683	18.605	15.932	11.988	−5.586	14.340
CP 92-1684	11.722	15.492	14.289	12.484	13.717	14.873	11.522	−1.442	13.443
CP 92-1641	9.702	14.368	14.663	14.312	14.037	14.619	11.608	−2.750	13.330
CP 92-1640	10.426	14.340	14.292	15.168	13.074	14.409	10.063	−3.299	13.110
CP 92-1607	9.173	16.319	15.162	11.497	12.569	14.651	11.621	−4.972	12.999
CP 92-1320	10.017	13.896	16.421	12.374	10.084	14.743	8.807	−6.336	12.335
CP 92-1647	11.919	8.600	9.006	7.714	8.524	8.337	7.847	−16.653	8.850
Mean	11.717	15.060	15.457	13.325	14.601	15.918	10.659	−5.126	13.819
LSD† (p=0.1)	3.555	2.348	3.094	2.272	2.563	2.652	2.294		1.592
CV‡ (%)	36.443	18.727	24.042	20.485	21.088	20.016	25.848		23.636

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 1.30 TS/H at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 18. Yields of cane (in metric tons per ha—TC/H) and theoretical recoverable yields of 96° sugar (in kg per metric ton of cane—KS/T and in metric tons per ha—TS/H) from second-ratoon cane on Torry muck and Malabar sand

	Mean yield by soil type, farm, and sampling date								
	Cane yield (TC/H)			Sugar yield (KS/T)			Sugar yield (TS/H)		
	Torry muck	Malabar sand		Torry muck	Malabar sand		Torry muck	Malabar sand	
Clone	Eastgate 12/15/98	Hilliard 10/26/98	Mean yield	Eastgate 12/15/98	Hilliard 10/26/98	Mean yield	Eastgate 12/15/98	Hilliard 10/26/98	Mean yield
CP 91-1238	197.79	76.55	137.17	118.6	132.2	125.4	23.530	10.103	16.816
CP 70-1133	166.89	109.47	138.18	113.5	121.8	117.6	18.916	13.322	16.119
CP 91-1560	170.51	82.80	126.66	111.4	123.7	117.6	19.026	10.203	14.614
CP 91-1150	146.12	79.13	112.63	126.7	135.5	131.1	18.539	10.683	14.611
CP 91-1883	174.15	59.48	116.81	123.0	125.9	124.5	21.385	7.521	14.453
CP 91-1914	136.84	79.49	108.16	122.8	139.1	130.9	16.823	11.041	13.932
CP 91-1980	146.25	82.06	114.15	119.5	126.1	122.8	17.520	10.321	13.921
CP 91-1865	146.74	67.60	107.17	119.7	125.3	122.5	17.504	8.549	13.027
CP 91-1880	142.23	80.73	111.48	110.1	127.8	118.9	15.596	10.296	12.946
CP 91-1062	138.98	72.12	105.55	112.6	123.7	118.2	15.726	8.928	12.327
CP 91-2246	113.32	83.64	98.48	113.1	122.6	117.8	12.797	10.226	11.511
CP 91-1924	104.46	85.18	94.82	123.9	117.7	120.8	12.968	9.958	11.463
Mean	148.69	79.85	114.27	117.9	126.8	122.3	17.527	10.096	13.812
LSD† (p=0.1)	26.12	13.84	37.59	7.0	8.1	3.2	3.179	1.825	4.466
CV‡ (%)	21.10	20.82	21.97	7.1	7.6	7.4	21.790	21.719	22.546

* Stability-safety index for each clone is calculated at $p = 0.01$ by Eskridge's method and use of Shukla's stability-variance parameter. To compare two negative indices, the index with the lowest absolute value is the greater of the two.

† *LSD* for location means = 5.59 TC/H for cane yield and 2.83 KS/T and 0.881 TS/H for sugar yield at $p = 0.10$.

‡ *CV* = coefficient of variation.

Table 19. Dates of stalk counts at 12 plant-cane, 7 first-ratoon, and 9 second-ratoon experiments

	Crop		
Location	Plant cane	First ratoon	Second ratoon
Duda	8/17/98	7/9/98	8/13/98
Eastgate	7/5/98	8/24/98	8/18/98
Hilliard	9/23/98	10/2/98	10/1/98
Knight	7/13/98	7/14/98	7/15/98
Lykes	10/9/98	—	10/8/98
Lykes (CP 93 series)	10/7/98	—	—
Okeelanta	7/28/98	8/31/98	9/9/98
Okeelanta (successive)	10/6/98	9/3/98	—
Sugar Farms Co-Op East	7/30/98	—	8/4/98
Sugar Farms Co-Op East (CP 93 series)	7/31/98	—	—
Sugar Farms Co-Op West	8/6/98	—	8/10/98
Wedgworth	7/16/98	7/21/98	7/29/98